EMERGENCY RESPONSE
QUALITY ASSURANCE SAMPLING PLAN

FOR

HURRICANE KATRINA RESPONSE SUPPORT
INTERSTATE HIGHWAYS 10 AND 610 INTERSECTION
NEW ORLEANS, ORLEANS PARISH, LOUISIANA

Prepared for

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1. INTRODUCTION

Under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, Weston Solutions, Inc. (WESTON®), the Superfund Technical Assessment and Response Team (START-2) contractor, has been tasked by the U.S. Environmental Protection Agency (EPA) Region 6 Response and Prevention Branch (RPB) under Contract Number 68-W-01-005, Technical Direction Document (TDD) No. 06-05-08-0011 (Appendix E) to perform sampling activities at six locations impacted by Hurricane Katrina. The locations are in New Orleans, Orleans Parish, Louisiana, in the area of the intersection of Interstate Highway 10 (I-10) and I-610. START-2 has prepared this Quality Assurance Sampling Plan (QASP) to describe the technical scope of work to be completed at the as part of the Emergency Response.

1.1 PROJECT OBJECTIVES

START-2 is providing technical assistance to EPA Region 6. The objective is to determine the presence of priority pollutants in storm water runoff resulting from Hurricane Katrina that poses an imminent and substantial danger to life and health.

The objective will be achieved by collecting six representative samples with duplicates from locations in the southern Louisiana area impacted by Hurricane Katrina.

1.2 PROJECT TEAM

The Project Team will consist of Jeff Criner, as the START-2 Deputy Program Manager; Heth Parnell, as the START-2 Project Team Leader (PTL); Chad Hall, as the Site Health and Safety Coordinator (SHSC); and additional START-2 personnel as necessary. The PTL will be responsible for the technical quality of work performed in the field and will serve as the START-2 liaison to EPA Region 6 and local authorities, while coordinating START-2 personnel in the field during the site activities. The PTL, with the concurrence of EPA, will direct the START-2 team in determining the location for sample collection in the field, collecting samples as necessary, logging the activities at each sample location in the field logbook, and verifying the sample documentation.

1.3 QASP FORMAT

This QASP has been organized in a format that is intended to facilitate and effectively meet the project objectives. The QASP is organized in the following sections:

- Section 1 - Introduction
- Section 2 - Site Background
- Section 3 - Sampling Approach and Procedures
- Section 4 - Analytical Approach
- Section 5 - Quality Assurance

Appendices are attached with the following information:

- A Data Quality Objective
- B Standard Operating Procedures
- C SCDM Benchmarks
- D EPA MSSLs
- E Copy of TDD No. 06-05-08-0011 and Amendment A

2. SITE BACKGROUND

On 25 August 2005, Hurricane Katrina made first landfall on the south Florida coast, then crossed the state and greatly increased in intensity as it moved over the Gulf of Mexico. On 28 August 2005, Hurricane Katrina turned north and made second landfall on the south U.S. coast, causing massive damage and flooding to broad areas of Alabama, Louisiana, and Mississippi. EPA Region 6 has sent and is continuing to send personnel and resources to Louisiana to address hurricane damage and in anticipation of upcoming needs.

2.1 SITE LOCATION AND DESCRIPTION

The southern area of Louisiana is part of the extensive landfall area impacted by Hurricane Katrina, and most of the area is currently flooded. The sampling will be conducted in New Orleans, Orleans Parish, Louisiana, at the intersection of Interstate Highways 10 (I-10) and I-610.

2.2 SITE CONCERNS

The primary concern for the southern Louisiana area is to determine the presence of priority pollutants in storm water runoff resulting from Hurricane Katrina that poses an imminent and substantial danger to life and health.

3. SAMPLING APPROACH AND PROCEDURES

Samples collected by START-2 will be used to evaluate the nature of the contaminants present.

3.1 OVERVIEW OF SAMPLING ACTIVITIES

The EPA OSC and START-2 will determine appropriate sample locations. START-2 will use SCRIBE software to manage sample data.

3.1.1 Health and Safety Plan Implementation

START-2 will provide planning functions consistent with activities and responsibilities of the Incident Command System (ICS). At the beginning of each operational period, a daily operation meeting will be held in the command post to discuss objectives of the operation period, division assignments, field instrumentation calibration and use, and health and safety. Every afternoon, a planning meeting will be conducted to develop a daily Incident Action Plan (IAP) for the next operation period. As part of ICS, local response officials including the fire and police departments and the local hospital will be notified to preplan for emergencies that may occur during the course of the emergency response sampling activities.

START-2 field activities will be conducted in accordance with the site-specific health and safety plan (HASP). The Field Safety Officer (FSO) will be responsible for implementation of the HASP during all field investigation activities. The HASP specifies that surface water sampling will proceed in Level D (safety glasses, disposable gloves, and steel-toed boots). All START-2 subcontractors will be required to conduct their activities according to the guidelines and requirements of the HASP. In accordance with the WESTON general health and safety operating procedures, the field team will be advised of the location of the hospital specified in the HASP prior to initiating sampling activities. All START-2 members have been advised not to enter areas deemed unsecured.

3.1.2 Community Relations

Community relations may require additional EPA involvement due to the general nature of the site. It is anticipated that the EPA OSC will be available at all times, and community relations

issues will be directed to the EPA OSC. If the EPA OSC is not present, the START-2 PTL, under the guidance of the WESTON Deputy Program Manager, will manage community relations in the field as directed by the EPA OSC. If a community relations plan and implementation program becomes necessary, START-2 will establish each if requested by the EPA OSC. START-2 will work as directed by the EPA to obtain access to all designated sites.

3.2 SAMPLING/MONITORING APPROACH

All samples will be collected in general accordance with the WESTON standard operating procedures (SOPs) (Appendix B). The specific sampling procedures are described below.

3.2.1 Sampling

All samples will be collected utilizing best available methods and placed immediately into appropriate sample containers. Deviations from the sample locations will be due to new observations made prior to sampling, information obtained in the field that warrants an altered sampling point, security considerations in the field, or limited access. The EPA OSC will be notified, and concurrence will be obtained should significant deviations from the planned sampling points be proposed. Details regarding deviations of the QASP will be documented in the site logbook.

The surface water samples will be delivered to Sherry Laboratories, Lafayette, Louisiana; to EMSL in Houston, Texas; and to the EPA Region 6 Laboratory in Houston, Texas, where volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), total metals, pesticides, herbicides, polychlorinated biphenyls (PCBs), and total coliform analyses will be conducted, utilizing EPA publication SW-846, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* and the Environmental Microbiology Proficiency Analytical Testing (EMPAT) Program testing (the holding time is 24 hours).

3.2.2 Sampling and Sample Handling Procedures

Samples will be collected using equipment and procedures appropriate to the matrix, parameters, and sampling objective. The volume of the sample collected must be sufficient to perform the

laboratory analysis requested. Samples must be stored in the proper types of containers and preserved in a manner appropriate to the analysis to be performed.

All clean, decontaminated sampling equipment and sample containers will be maintained in a clean, segregated area. All samples will be collected with clean decontaminated equipment (Appendix B, SOP 1201.01). All samples collected for laboratory analysis will be placed directly into pre-cleaned, unused glass or plastic containers. Sampling personnel will change gloves between each sample collection/handling. All samples will be assembled and catalogued prior to shipping (Appendix B, SOPs 1101.01 and 1102.01) to the designated laboratory.

START-2 is required to contact the EPA Houston laboratory personnel contacted once the samples are in route and again within an hour of their arrival to the laboratory; the Primary Contact is Rick McMullian at telephone number 832-443-4568, and the Secondary Contact is Diane Greg at telephone number 281-723-5296.

3.3 SURFACE WATER SAMPLING

START-2 will collect six surface water samples (including six duplicate surface water samples) as part of the emergency response task to document a release to surface water. Surface water samples and duplicates will be collected concurrently from each sample locations.

3.4 SAMPLE MANAGEMENT

Specific nomenclature that will be used by WESTON will provide a consistent means of facilitating the sampling and overall data management for the project (Appendix B, SOP 0110.04). The WESTON Deputy Program Manager must approve any deviations from the sample nomenclature proposed below.

As stated in SOP 0110.04, sample nomenclature will follow a general format regardless of the type or location of the sample collected. The general nomenclature consists of the following components:

- Geographic location (e.g., location within a school or park).
- Collection type (composite, grab, etc.).

- QA/QC type (normal, duplicate, etc.).
- Sequence - An additional parameter used to further differentiate samples.

Sample data management will be completed utilizing the EPA-provided Forms II Lite software.

3.5 DECONTAMINATION

The nondisposable sampling equipment used during the sample collection process will be thoroughly pre-cleaned before initial use, between use, and at the end of the field investigation. Equipment decontamination will be completed in the following steps:

- High-pressure water spray or brush, if needed.
- Nonphosphate detergent and potable water wash to clean the equipment.
- Final potable water rinse.
- Equipment air-dried.

Personnel decontamination procedures will be described in the site-specific HASP that will be prepared by WESTON prior to implementation of activities at the site.

3.6 SAMPLE PRESERVATION, CONTAINERS, AND HOLD TIMES

Once collected, samples will be stored on ice at 4 degrees Celsius in coolers while at the site and until submitted for laboratory analysis. The samples will be sent by common carrier to the laboratory or driven by the WESTON START-2 members.

WESTON will receive analytical results based on discussions with the EPA OSC. This turnaround time is initiated when the samples are collected in the field and continues until the analytical results are made available to WESTON either verbally or by providing facsimile or email copies of the results for review. Samples that have been analyzed will be disposed by the designated laboratory in accordance with the laboratory SOPs.

4. ANALYTICAL APPROACH

Samples collected by START-2 during the sampling task will be delivered to EPA-designated laboratories for VOCs, SVOCs, total metals, pesticides, herbicides, PCBs, and total coliform analyses, utilizing EPA publication SW-846, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* and EMPAT Program testing. In determining the nature and extent of potential contamination, analytical results will be compared to EPA Region 6 Human Health Medium-Specific Screening Levels (MSSLs) in addition to site-specific background levels. Additionally, the analytical results will be compared to site-specific background concentrations (to determine areas of observed contamination) and to media-specific benchmarks identified in the EPA Superfund Chemical Data Matrix (SCDM) tables (version 27, January 2004). The SCDM Benchmarks and EPA MSSLs are provided as Appendix C and D, respectively. Table 4-1 provides requirements for containers, preservation techniques, sample volumes, and holding times

TABLE 4-1

REQUIREMENTS FOR CONTAINERS, PRESERVATION TECHNIQUES, SAMPLE VOLUMES, AND HOLDING TIMES

Name	Analytical Methods	Container	Preservation	Minimum Sample Volume or Weight	Maximum Holding Time
VOCs	SW8260B	G, amber, (Teflon lined septum for water; 40 ml Teflon lined)	4°C, HCl to pH<2 (pH adjust for water only)	3 x 40 mL vials (for water)	14 days (7 days if unpreserved by acid) for water
SVOCs	SW8270C	G, Teflon lined cap	4°C	1 liter	7 days extract/40 days analysis (water)
Total Metals	6010	P	HNO_3 to pH<2, 4°C	500 mL	28 days (water) for Mercury 180 days (water) all other metals
Pesticides	8081B	G, Teflon-lined cap	4°C	1 liter	7 days until extraction and 40 days after extraction (water)
PCBs	8082B	G, Teflon-lined cap	4°C	1 liter	7 days until extraction and 40 days after extraction (water)
Coliform	EMPAT stds	G	4°C	1 liter	24 hours
Herbicides	8151	G	4°C	1 liter	7 days until extraction and 40 days after extraction (water)

5. QUALITY ASSURANCE

Quality assurance will be conducted in accordance with the WESTON Quality Assurance Project Plan (QAPP) and the site-specific quality assurance information included in Appendix A.

5.1 QUALITY ASSURANCE SAMPLES

START-2 will collect field duplicate samples of surface water samples and prepare equipment rinsate blank samples as needed during the emergency response sampling activities. Quality assurance/quality control (QA/QC) samples will be collected according to the following:

- Equipment rinsate blanks will be prepared by pouring laboratory grade deionized water over nondisposable sampling equipment after it has been decontaminated and collecting the rinse water in sample containers for analyses. These samples will be prepared to demonstrate that the equipment decontamination procedures for the sampling equipment were performed effectively. The equipment rinsate blanks will be prepared each day that nondisposable sampling equipment is used. It is estimated that one equipment rinsate samples will be collected during sampling activities.

- Field blanks will be collected when VOC samples are taken and are analyzed only for VOC analytes. The field blank consists of American Society of Testing and Materials (ASTM) Type II reagent grade water poured into a VOC sample vial at the sampling site. It is handled like an environmental sample and transported to the laboratory for analysis. Field blanks are used to assess the potential introduction of contaminants from ambient sources (e.g., gasoline motors in operation, etc.) to the samples during sample collection. Field blanks shall be collected and submitted once per day that VOC samples are collected.

- Laboratory prepared trip blanks will be submitted with each shipment containing samples for VOC analysis. The laboratory prepared trip blanks will consist of two 40-milliliter glass sample containers with Teflon lined septum caps. The trip blanks will be prepared with deionized water prior to leaving the laboratory. Trip blanks are used to evaluate the potential cross-contamination that may occur during the shipment of samples.

- Temperature blanks will be prepared in the field and will consist of one 40-milliliter glass sample container with Teflon lined septum cap. The temperature blank will be packaged along with the field samples in the shipping cooler and will represent the temperature of the incoming cooler upon receipt at the laboratory. Use of these samples within a shipping container enables the laboratory to assess the temperature of the shipment without disturbing any of the field samples.

5.2 SAMPLE CHAIN-OF-CUSTODY PROCEDURES

START-2 will utilize Scribe desktop and Scribe Enterprise for all sample documentation and chain-of-custody (COC) preparation needs. Because of the evidentiary nature of sample collection, the possession of samples must be traceable from the time the samples are collected until they are introduced as evidence in legal proceedings. After sample collection and identification, the samples will be maintained under the COC procedures. If the sample collected is to be split with a third party, the sample will be allocated into similar sample containers. Sample labels completed with the same information, as that on the original sample container, will be attached to each of the split samples. All personnel required to package and ship coolers containing potentially hazardous material will be trained accordingly.

The COC procedures are documented in SOP 1101.01, Appendix A, and will be made available to all personnel involved with the sampling. A typical COC record included in SOP 1101.01 will be completed each time a sample or group of samples is prepared for shipment to the laboratory. The record will repeat the information on each of the sample labels and will serve as documentation of handling during shipment. A copy of this record will remain with the shipped samples at all times, and the member of the sampling team who originally relinquished the samples will retain another copy. START-2 personnel will complete a COC form for all samples sent to a START-2 designated off-site laboratory.

Samples relinquished to the participating laboratories will be subject to the following procedures for transfer of custody and shipment:

- The COC record will accompany samples. When transferring possession of samples, the individuals relinquishing and receiving the samples will sign, date, and note the time of the sample transfer on the record. This custody record documents transfer of sample custody from the sampler to another person or to the laboratory.

- Samples will be properly packed for shipment and dispatched to the appropriate laboratory for analysis with separate, signed custody records enclosed in each sample box or cooler. Sample shipping containers will be custody-sealed for shipment to the laboratory. The preferred procedure includes use of a custody seal wrapped across

filament tape that is wrapped around the package at least twice. The custody seal will then be folded over and stuck to the seal to ensure that the only access to the package is by cutting the filament tape or breaking the seal to unwrap the tape.

- If sent by common carrier, a bill of lading or airbill will be used. Bill of lading and airbill receipts will be retained in the project file as part of the permanent documentation of sample shipping and transfer.

SOPs 1101.01 and 1102.01, provided in Appendix A, describe these procedures in more detail.

5.3 PROJECT DOCUMENTATION

Field Documentation

START-2 will perform field documentation of site activities during all fieldwork. The primary methods of documentation will be completion of a field logbook and production of photographic documentation. All documents will be completed legibly and in ink. Any corrections or revisions will be made by lining through the original entry and initialing the change. The following field documentation will be maintained:

Field Logbook (SOP 1501.01)

The field logbook is a descriptive notebook detailing site activities and observations so that an accurate, factual account of field procedures may be reconstructed. The individuals making them will sign all entries. Entries should include, at a minimum, the following:

- Site name and project number.
- Names of personnel on-site.
- Dates and times of all entries.
- Descriptions of all site activities, including site entry and exit times.
- Noteworthy events and discussions.
- Weather conditions.

- Site observations.
- Identification and description of samples and locations.
- Subcontractor information and names of on-site personnel.
- Dates and times of sample collections and COC information.
- Records of photographs.
- Site sketches.

Sample Labels

Sample labels will be securely affixed to the sample container. They will clearly identify the particular sample and should include the following information:

- Site name and project number.
- Date and time the sample was collected.
- Sample preservation method.
- Analysis requested.
- Sampling location.

COC Record (SOP 1101.01)

A COC record will be maintained from the time of sample collection until final deposition. Every transfer of custody will be noted and signed, and each individual who has signed it will keep a copy of the record. The COC is discussed in Subsection 5.1, Sample Chain-of-Custody Procedures.

Custody Seal

Custody seals demonstrate that a sample container has not been opened or tampered. The individual who has custody of the samples will sign and date the seal and affix it to the container in such a manner that it cannot be opened without breaking the seal.

Photographic Documentation

Photographic documentation will be used by START-2 to document site conditions and activities as site work progresses. Initial conditions should be well documented by photographing features that define site-related contamination or special working conditions. Representative photographs should be obtained of phase of site activity. The photographs should show typical operations and operating conditions as well as special situations and conditions that may arise during site activities. Site final conditions should also be documented by photograph as a record of how the site appeared at completion of the work.

All photographs should be provided by using a film camera, a digital camera, or a video camera capable of recording the date on the image. Details of each photograph should be recorded in the logbook with the location of the photographer, direction the photograph was taken, the subject of the photograph, and its significance (i.e., why the picture was taken). Where appropriate, the photograph location, direction, and subject should also be shown on a site sketch. SOPs 1502.01 and 1502.02, Appendix B, discuss photographic documentation in more detail.

APPENDICES

APPENDIX A

SURFACE WATER DATA QUALITY OBJECTIVE

DATA QUALITY OBJECTIVE NO. 1
HURRICANE KATRINA
MEDIA OF CONCERN: SURFACE WATER

STEP 1. STATE THE PROBLEM	
Surface water samples will be collected from storm water resulting from Hurricane Katrina to determine if there is a release to surface water with concentrations of chemicals of concern.	
STEP 2. IDENTIFY THE DECISION	
Are the concentrations of chemicals of concern in surface water, represented by a sample, above specified benchmarks?	
IDENTIFY THE ALTERNATIVE ACTIONS THAT MAY BE TAKEN BASED ON THE DECISIONS.	• If any contaminant exceeds the specified benchmark in the surface water, the media represented by that sample will be considered contaminated and will require additional attention. • If no contaminants exceed the specified benchmarks in surface water, the media represented by that sample will not require additional attention.
STEP 3. IDENTIFY INPUTS TO THE DECISION	
IDENTIFY THE INFORMATIONAL INPUTS NEEDED TO RESOLVE A DECISION.	Contaminant concentrations in surface water samples collected from the Hurricane Katrina storm water.
IDENTIFY THE SOURCES FOR EACH INFORMATIONAL INPUT AND LIST THE INPUTS THAT ARE OBTAINED THROUGH ENVIRONMENTAL MEASUREMENTS.	• Surface water samples from the Hurricane Katrina storm water. • Analytical results from VOC, SVOC, pesticides, herbicides, total vetals, PCBs, and total coliform.
BASIS FOR THE CONTAMINANT SPECIFIC ACTION LEVELS.	For surface water, Superfund Chemical Data Matrix (SCDM) Benchmarks and EPA MSSLs.
IDENTIFY POTENTIAL SAMPLING TECHNIQUES AND APPROPRIATE ANALYTICAL METHODS.	• Grab samples from the Hurricane Katrina storm water (SOP 1002.01). • See Table 4-1 QASP

DATA DATA QUALITY OBJECTIVE NO. 1
HURRICANE KATRINA
MEDIA OF CONCERN: SURFACE WATER (Continued)

STEP 4. DEFINE THE BOUNDARIES OF THE STUDY	
DEFINE THE DOMAIN OR GEOGRAPHIC AREA WITHIN WHICH ALL DECISIONS MUST APPLY.	Locations within Louisiana as determined by EPA.
SPECIFY THE CHARACTERISTICS THAT DEFINE THE POPULATION OF INTEREST.	Contaminant concentrations in surface water at the sample locations.
DEFINE THE SCALE OF DECISION MAKING.	The scale of decision will be for the site activities occurring at the time of the sample collection.
DETERMINE THE TIME FRAME TO WHICH THE DATA APPLY.	The analytical data will apply until the surface water represented by the sample receives appropriate response action.
DETERMINE WHEN TO COLLECT DATA.	Samples will be collected during the field sampling activities.
IDENTIFY PRACTICAL CONSTRAINTS ON DATA COLLECTION.	• Inclement weather. • Access not attainable.
STEP 5. DEVELOP A DECISION RULE	
SPECIFY THE PARAMETER THAT CHARACTERIZES THE POPULATION OF INTEREST.	The concentrations of chemicals identified in surface water samples.
SPECIFY THE ACTION LEVEL FOR THE DECISION.	For surface water, Superfund Chemical Data Matrix (SCDM) Benchmarks included as Appendix C and EPA MSSLs included in Appendix D
DEVELOP A DECISION RULE.	If any result in a surface water sample is above the contaminant specific action level or background, then the media represented by that sample may require additional attention, otherwise the surface water does not require additional attention. Additional attention means more sampling, surface water collection and treatment, or other action deemed necessary by EPA.

DATA DATA QUALITY OBJECTIVE NO. 1
HURRICANE KATRINA
MEDIA OF CONCERN: SURFACE WATER (Continued)

STEP 6. SPECIFY LIMITS ON DECISION ERRORS	
DETERMINE THE POSSIBLE RANGE OF THE PARAMETER OF INTEREST.	Contaminant concentrations may range from 0 mg/L for surface water to more than the contaminant specific action level.
DEFINE BOTH TYPES OF DECISION ERRORS AND IDENTIFY THE POTENTIAL CONSEQUENCES OF EACH.	Type I Error: Deciding that the specified area represented by the surface water sample does not exceed the specified assessment level when, in truth, the surface water concentration of the contaminant exceeds its specified action level. The consequence of this decision error is that contaminated surface water will remain on-site or flow off-site, possibly endangering human health and the environment. This decision error is more severe.
DEFINE BOTH TYPES OF DECISION ERRORS AND IDENTIFY THE POTENTIAL CONSEQUENCES OF EACH.	Type II Error: Deciding that the specified area represented by the surface water sample does exceed the specified action level when, in truth, it does not. The consequences of this decision error is that remediation of the specified area will take place and unnecessary costs will be incurred.
ESTABLISH THE TRUE STATE OF NATURE FOR EACH DECISION RULE.	The true state of nature when the surface water is decided to be below the specified action levels when in fact, it is not below the specified action levels, is that restrictions may not be necessary. The true state of nature when the surface water is decided to be above the specified action levels when in fact, it is not above the specified action levels, is that restrictions may not be necessary.
DEFINE THE TRUE STATE OF NATURE FOR THE MORE SEVERE DECISION ERROR AS THE BASELINE CONDITION OR THE NULL HYPOTHESIS (H_o) AND DEFINE THE TRUE STATE FOR THE LESS SEVERE DECISION ERROR AS THE ALTERNATIVE HYPOTHESIS (H_a).	H_o: The surface water represented by the sample is above the specified action level. H_a: The surface water represented by the sample is below the specified action level.

DATA DATA QUALITY OBJECTIVE NO. 1
HURRICANE KATRINA
MEDIA OF CONCERN: SURFACE WATER (Continued)

ASSIGN THE TERMS "FALSE POSITIVE" AND "FALSE NEGATIVE" TO THE PROPER DECISION ERRORS.	• False Positive Error = Type I • False Negative Error = Type II
ASSIGN PROBABILITY VALUES TO POINTS ABOVE AND BELOW THE ACTION LEVEL THAT REFLECT THE ACCEPTABLE PROBABILITY FOR THE OCCURRENCES OF DECISION ERRORS.	The assignment of probability values is not applicable to these DQOs because these samples are being collected for baseline and screening purposes.

DATA QUALITY OBJECTIVE NO. 1
HURRICANE KATRINA
MEDIA OF CONCERN: SURFACE WATER (Continued)

STEP 7. OPTIMIZE THE DESIGN	
REVIEW THE DQOs.	Surface water sample locations will be determined in the field based on flooding and potential direction of overland flow.
DEVELOP GENERAL SAMPLING AND ANALYSIS DESIGN. START-2 will collect six surface water samples and six duplicates as part of the Hurricane Katrina emergency response. The samples will be grab samples and will be collected in accordance with SOP 1002.01. These samples will be used to determine if contamination exists. These samples will be analyzed for VOCs. SVOCs, total metals, pesticides, herbicides, PCBs, and total coliform.	

APPENDIX B

STANDARD OPERATING PROCEDURES

REFERENCED STANDARD OPERATING PROCEDURES

SOP	**0110.04**				
GROUP	Database Management System				
SUB-GROUP	Data Collection and Acquisition				
TITLE	On-Site Sample Nomenclature - On-Site Sampling Activities				
DATE	9/8/2005	**FILE**	0110-04.DOC	**PAGE**	1 of 1

INTRODUCTION

The following Standard Operating Procedure (SOP) presents the remediation sample nomenclature for analytical samples. The sample nomenclature is based upon specific code requirements for compatibility with the WESTON On-Line system

PROCEDURE

Sampling Stations.

Station Type	Template
Soil Stockpile	SS##
Monitoring Well	MW##
Surface Water Pond	POND##
Air Sampler	AIR##

Sample Nomenclature.

Sample Type	Template	Example
Soil Composite Sample	Stockpile - Type - QC - Sequence	SS01-CO-N-1
Surface Water Sample	Surface Water Pond-Type-QC-Sequence	POND03-CO-N-1
Groundwater Sample	Monitoring Well-Type-QC-Sequence	MW12-CO-N-1
Ambient Air Sample	Air Sampler-Sample Type-QC Type-Sequence	AIR01-TI-N-1

Note: Sequence is a numeric counter to make Sample ID unique if more than one sample is collected.

Sample Types.

Sample Type Description	Code
Composite	CO
Grab	G
Product – DNAPL	PD
Product – LNAPL	PL
Split	SP
Time Integrated	TI

QA/QC Types.

QA/QC Type Description	Code
Normal	N
Duplicate	D
Field Blank	FB
Rinse Blank	RB
Trip Blank	TB

INTRODUCTION

The following Standard Operating Procedure (SOP) is to describe the procedures for collecting representative surface water samples. Analysis of surface samples may determine whether concentrations of specific soil pollutants exceed established action levels, or if the concentrations of pollutants present a risk to public health, welfare, or the environment.

PROCEDURE

Surface water samples may be collected using a variety of methods and equipment. The methods and equipment used are usually dependent on the location of the body of water being sampled. Sampling can be performed by merely submerging the sample container, a weighted-bottle sampler with stopper, a bailer, or by pump assisted methods. Several types of pumps can be used for sampling depending on the objectives of sampling and the site conditions.

Sample Preservation

Samples are to be preserved in conformance with the site-specific Quality Assurance Project Plan, Sampling and Analysis Plan or work plan. In general these requirements include refrigeration to 4°C, addition of appropriate additives (HCl, H_2SO_4, NaOH) to adjust and fix pH, and a defined maximum holding time. If a site-specific plan is not available, the analytical laboratory should be consulted for the appropriate preservation procedures.

Interferences and Potential Problems

There are two primary interferences or potential problems associated with surface water sampling: cross-contamination of samples and improper sample collection. Cross-contamination problems can be eliminated or minimized through the use of dedicated sampling equipment. If this is not possible or practical, then decontamination of sampling equipment is necessary. Improper sample collection can involve using contaminated equipment, undue disturbance of the sample matrix, or improper sample location.

Equipment or Apparatus

- Ziploc plastic bags
- Logbook
- Labels
- Chain-of-custody forms and seals
- Coolers
- Ice
- Decontamination supplies and equipment
- Discharge tubing
- Sample containers
- Sampling devices

Preparation

1. Determine the extent of the sampling effort, the sampling methods to be employed, and which equipment and supplies are required.
2. Obtain necessary sampling and monitoring equipment.
3. Decontaminate or preclean equipment, and ensure that it is in working order.
4. Prepare schedules, and coordinate with staff, client, and regulatory agencies, if appropriate.
5. Perform a general site survey prior to site entry in accordance with the site-specific health and safety plan.

Surface Water Sampling

Samples from shallow depths can be readily collected by merely submerging the sample container. In flowing surface water bodies, the container's mouth should be positioned so that it faces upstream, while the sampling personnel stand downstream so as not to stir up sediment that could potentially contaminate the sample.

Collecting a representative sample from a larger body of surface water requires that samples be collected near the shore unless boats are feasible and permitted. If boats are used, the body of water should be cross sectioned, and samples should be collected at various depths across the body of water in accordance with the specified sampling plan. For this type of sampling, a weighted-bottle sampler is used to collect samples at a predetermined depth. The sampler consists of a glass bottle, a weighted sinker, a bottle stopper, and a line that is used to open the bottle and to lower and raise the sampler during sampling. The procedure for use is as follows:

- Assemble the weighted bottle sampler.
- Gently lower the sampler to the desired depth so as not to remove the stopper prematurely.
- Pull out the stopper with a sharp jerk of the sampler line.
- Allow the bottle to fill completely, as evidenced by the cessation of air bubbles.
- Raise the sampler and cap the bottle.
- Wipe the bottle clean. The sampling bottle can be also be used as the sample container for shipping.

Teflon bailers have also been used where feasible for collecting samples in deep bodies of water.

Another method of extending the reach of sampling efforts is the use of a small peristaltic pump. In this method the sample is drawn through heavy-wall Teflon tubing and pumped directly into the sample container. This system allows the operator to reach into the liquid body, sample from depth, or sweep the width of narrow streams.

The general sampling procedures are listed below:

1. Collect the sample using whichever technique, submerged bottle, bottle sampler with stopper, pump & tubing, or bailer.
2. The collected sample may be collected in the sample containers or may be transferred

to the appropriate sample containers in order of the volatile organics first and inorganics last.

3. Label sample containers, place on ice in a cooler, remove, and decontaminate equipment as necessary.

REFERENCES

SOP 0110.01 Sample Nomenclature
SOP 1005.01 Field Duplicate Collection
SOP 1005.02 Rinse Blank Preparation
SOP 1005.03 Field Blank Preparation
SOP 1101.01 Sample Custody - Field
SOP 1102.01 Sample Shipping
SOP 1201.01 Sampling Equipment Decontamination
SOP 1501.01 Field Logbook

SOP	**1101.01**				
GROUP	Sampling Handling				
SUB-GROUP	Sample Custody				
TITLE	Sample Custody in the Field				
DATE	**9/8/2005**	**FILE**	Document1	**PAGE**	1 of 1

INTRODUCTION

The following Standard Operating Procedure (SOP) presents procedures for maintaining sample chain of custody (COC) during activities where samples are collected.

PROCEDURE

Sample custody is defined as being under a person's custody if any of the following conditions exist:

- It is in their possession.
- It is in their view, after being in their possession.
- It was in their possession and currently located in locked area with the person claiming custody only having access to the area.
- It is in a designated secure area.

A designated field sample team member will be personally responsible for the care and custody of collected samples until the samples are transferred to another person or properly dispatched to the laboratory. To the extent practicable, as few people as possible will handle the samples.

Sample tags or labels will be completed and applied to the container of each sample. When the tags or labels are being completed, waterproof ink will be used. If waterproof ink is not used, the tags or labels will be covered by transparent waterproof tape. Sample containers may also be placed in Ziploc-type storage bags. These storage bags aid in keeping the sample container dry. Also, should the sample container break, the bag will aid to retain the sample container contents. Information typically included on the sample tags or labels will include the following:

- Project Code
- Station Number and Location
- Sample Identification Number
- Date and Time of Sample Collection
- Type of Laboratory Analysis Required
- Preservation Required, if applicable
- Collector's Signature
- Priority (optional)
- Anticipated Concentration Range (Low, Medium, or High)
- Other Remarks

Additional information may include:

- Sample Analysis Priority

A COC form will be completed each time a sample or group of samples is prepared for transfer to the laboratory. The form will repeat the information on each of the sample labels and will serve as documentation of handling during shipment. The minimum information requirements of the COC form

are listed in Table 1101.01-A. An example COC form is shown in Figure 1101.01-A. The completed COC must be reviewed by the Field Team Leader or Site Manager prior to sample shipment. The COC form will remain each sample shipping container at all times, and another copy will be retained by the member of the sampling team who originally relinquished the samples or in a project file.

TABLE 1101.01-A CHAIN OF CUSTODY FORM

INFORMATION	COMPLETED BY	DESCRIPTION
COC	Laboratory	Enter a unique number for each chain of custody form
SHIP TO	Field Team	Enter the laboratory name and address
CARRIER	Field Team	Enter the name of the transporter (e.g., FedEx) or hand-carried
AIRBILL	Field Team	Enter the airbill number or transporter tracking number (if applicable)
PROJECT NAME	Field Team	Enter the project name
SAMPLER NAME	Field Team	Enter the name of the person collecting the samples
SAMPLER SIGNATURE	Field Team	Signature of the person collecting the samples
SEND RESULTS TO	Field Team	Enter the name and address of the prime contractor
FIELD SAMPLE ID	Field Team	Enter the unique identifying number given to the field sample (includes MS, MSD, field duplicate and field blanks)
DATE	Field Team	Enter the year and date the sample was collected in the format mm/dd/yy (e.g., 10/13/05)
TIME	Field Team	Enter the time the sample was collected in 24 hour format (e.g., 0900)
MATRIX	Field Team	Enter the sample matrix (e.g., water, soil)
PRESERVATIVE	Field Team	Enter the preservative used (e.g., HNO3, ice) or "none"
FILTERED/UNFILTERED	Field Team	Enter "F" if the sample was filtered or "U" if the sample was not filtered
CONTAINERS	Field Team	Enter the number of containers associated with the sample
MS/MSD	Field Team or Laboratory	Enter "X" if the sample is designated for the MS/MSD
ANALYSES REQUESTED	Field Team	Enter the method name of the analysis requested (e.g., SW6010A)
COMMENTS	Field Team	Enter comments
SAMPLE CONDITION UPON RECEIPT AT LABORATORY	Laboratory	Enter any problems with the condition of any sample(s)
COOLER TEMPERATURE	Laboratory	Enter the internal temperature of the cooler, in degrees C, upon opening
SPECIAL INSTRUCTIONS/ COMMENTS	Laboratory	Enter any special instructions or comments
RELEASED BY (SIG)	Field Team and Laboratory	Enter the signature of the person releasing custody of the samples
COMPANY NAME	Field Team and Laboratory	Enter the company name employing the person releasing/receiving custody
RECEIVED BY (SIG)	Field Team and Laboratory	Enter the signature of the person receiving custody of the samples
DATE	Field Team and Laboratory	Enter the date in the format M/D/YY (e.g., 6/3/96) when the samples were released/received
TIME	Field Team and Laboratory	Enter the date in 24 hour format (e.g., 0900) when the samples were released/received

SOP	**1102.01**				
GROUP	Sample Handling				
SUB-GROUP	Sample Shipping				
TITLE	Sample Shipping				
DATE	9/8/2005	**FILE**	1102-01.DOC	**PAGE**	1 of 1

INTRODUCTION

The following Standard Operating Procedure (SOP) presents the procedures for sample shipping that will be implemented during field work involving sampling activities.

TERMS

COC - Chain-of-Custody

PROCEDURE

Prior to shipping or transferring custody of samples, they will be packed according to DOT and/or IATA. requirements with sufficient ice to maintain an internal temperature of 4°C ± 2°C during transport to the laboratory. Samples relinquished to the participating laboratories will be subject to the following procedures for transfer of custody and shipment:

1. Samples will be accompanied by a COC record. When transferring possession of samples, the individuals relinquishing and receiving the samples will sign, date, and note the time of the sample transfer on the record. If sent by common carrier, a bill of lading or airbill should be used. Bill of lading and airbill receipts will be retained in the project file as part of the permanent documentation of sample shipping and transfer. This custody record documents transfer of sample custody from the sampler to another person or to the laboratory. The designated laboratory will accept custody in the field upon sample pick-up or at the laboratory if the samples are delivered via field personnel or a courier service.
2. Samples will be properly packed in approved shipping containers for laboratory pick-up by the appropriate laboratory for analysis, with separate, signed custody records enclosed in each sample box or cooler. Sample shipping containers will be padlocked or custody-sealed for transfer to the laboratory. The preferred procedure includes use of a custody seal wrapped across filament tape that is wrapped around the package at least twice. The custody seal will then be folded over and stuck to it so that the only access to the package is by cutting the filament tape or breaking the seal to unwrap the tape. The seal will then be signed. The designated laboratory will accept custody of the samples upon receipt.
3. Whenever samples are split with state representatives or other parties, the COC record will be marked to indicate with whom the samples were split.
4. The field sampler will call the designated laboratory to inform them of sample shipment and verify sample receipt as necessary.

SOP	**1201.01**				
GROUP	Decontamination				
SUB-GROUP	Sampling Equipment Decontamination				
TITLE	Sampling Equipment Decontamination				
DATE	9/8/2005	**FILE**	1201-01.DOC	**PAGE**	1 of 1

INTRODUCTION

The following Standard Operating Procedure (SOP) presents the methods used for minimizing the potential for cross-contamination, and provides general guidelines for sampling equipment decontamination procedures.

PROCEDURE

As part of the Health and Safety Plan (HASP), develop and set up a decontamination plan before any personnel or equipment enter the areas of potential exposure. The decontamination plan should include the following:

- The number, location, and layout of decontamination stations
- Which decontamination apparatus is needed
- The appropriate decontamination methods
- Methods for disposal of contaminated clothing, apparatus, and solutions

Decontamination Methods

Personnel, samples, and equipment leaving the contaminated area of a site will be decontaminated. Various decontamination methods will be used to either physically remove contaminants, inactivate contaminants by disinfection or sterilization, or both. The physical decontamination techniques appropriate for equipment decontamination can be grouped into two categories: abrasive methods and non-abrasive methods.

Abrasive Cleaning Methods

Abrasive cleaning methods work by rubbing/scrubbing the surface containing the contaminant. This method includes mechanical and wet blasting methods.

Mechanical cleaning methods use brushes of metal or nylon. The amount and type of contaminants removed will vary with the hardness of bristles, length of brushing time, and degree of brush contact.

Cleaning can also be accomplished by water blasting which is also referred to as steam cleaning and pressure washing. Pressure washing utilizes high-pressure that is sprayed from a nozzle onto sampling equipment to physically remove soil or (potentially) contaminated material. Steam cleaning is a modification of pressure washing where the water is heated to temperatures approaching 100°C to assist in removing organic constituents from equipment.

Disinfection/Rinse Methods

Disinfectants are a practical means of inactivating chemicals or contaminants of concern. Standard sterilization methods involve heating the equipment which is impractical for large equipment. Rinsing removes contaminants through dilution, physical attraction, and solubilization.

The use of distilled/deionized water commonly available from commercial vendors may be acceptable for decontamination of sampling equipment provided that it has been verified by laboratory analysis to be target analyte free. Tap water may be used from any municipal water treatment system for mixing of decontamination solutions. An untreated potable water supply is not an acceptable substitute for tap water. Acids and solvents are occasionally utilized in decontamination of equipment to remove metals and organics, respectively, from sampling equipment. Other than ethanol, these are avoided when possible due to the safety, disposal, and transportation concerns associated with them.

Equipment or apparatuses that may be selected for use include the following:

- Personal protective clothing.
- Non-phosphate detergent.
- Selected solvents for removal of polar and nonpolar organics (ethanol, methanol, and hexane).
- Acid washes for removal of metals (nitric acid).
- Long-handled brushes.
- Drop cloths or plastic sheeting.
- Paper towels.
- Galvanized tubs or buckets.
- Distilled, deionized, or tap water (as required by the project).
- Storage containers for spent wash solutions.
- Sprayers (pressurized and non-pressurized).
- Trash bags.
- Safety glasses or splash shield.

<u>Field Sampling Equipment Cleaning Procedures</u>

The following procedures should be followed:

1. Where applicable, follow physical removal procedures previously described (pressure wash, scrub wash).
2. Wash equipment with a non-phosphate detergent solution.
3. Rinse with tap water.
4. Rinse with distilled or deionized water.
5. Rinse with 10% nitric acid if the sample will be analyzed for metals/organics.
6. Rinse with distilled or deionized water.
7. Use a solvent rinse (pesticide grade) if the sample will be analyzed for organics.
8. Air dry the equipment completely.
9. Rinse again with distilled or deionized water.

10. Place in clean bag or container for storage/transport to subsequent sampling locations.

Selection of the solvent for use in the decontamination process is based on the contaminants present at the site. Solvent rinses are not necessarily required when organics are not a contaminant of concern and may be eliminated from the sequence specified below. Similarly, an acid rinse is not required if the analyses do not include inorganics. Use of a solvent is required when organic contamination is present on-site. Typical solvents used for removal of organic contaminants include acetone, ethanol, hexane, methanol, or water. An acid rinse step is required if metals are present on-site. If a particular contaminant fraction is not present at the site, the ten-step decontamination procedure listed above may be modified for site specificity.

Sampling equipment that requires the use of plastic tubing should be disassembled and the tubing replaced with clean tubing before commencement of sampling and between sampling locations. Plastic tubing should not be reused.

INTRODUCTION

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- Paper towels
- Galvanized tubs or buckets
- Distilled, deionized, or tap water (as required by the project)
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- Trash bags
- Safety glasses or splash shield

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Sampling equipment that requires the use of plastic tubing should be disassembled and the tubing replaced with clean tubing before commencement of sampling and between sampling locations. Plastic tubing should not be reused.

SOP	**1501.01**				
GROUP	Field Documentation				
SUB-GROUP					
TITLE	Field Logbook				
DATE	9/8/2005	**FILE**	1501-01.DOC	**PAGE**	1 of 1

INTRODUCTION

The following Standard Operating Procedure (SOP) presents the procedures for documenting activities observed or completed in the field in a field logbook. The documentation should represent all activities of WESTON personnel and entities under WESTON's supervision.

TERMS

FSP - Field Sampling Plan

SAP - Sampling and Analysis Plan

QAPP - Quality Assurance Project Plan

HASP - Health and Safety Plan

PROCEDURE

Field logbooks will be used and maintained during field activities to document pertinent information observed or completed by WESTON personnel or entities that WESTON is responsible for providing oversight. Field logbooks are legal documents that form the basis for later written reports and may serve as evidence in legal proceedings. The Site Manager or Field Team Leader will review field log entries daily and initial each page of entries. Field logbooks will be maintained by the Site Manager or Field Team Leader during field activities and transferred to the project files for a record of activities at the conclusion of the project. General logbook entry procedures are listed below.

- Logbooks must be permanently bound with all pages numbered to the end of the book. Entries should begin on page 1.
- Only use blue or black ink (waterproof) for logbook entries.
- Sign entries at the end of the day, or before someone else writes in the logbook.
- If a complete page is not used, draw a line diagonally across the blank portion of the page and initial and date the bottom line.
- If a line on the page is not completely filled, draw a horizontal line through the blank portion.
- Ensure that the logbook clearly shows the sequence of the day's events.

- Do not write in the margins or between written lines, and do not leave blank pages to fill in later.

- If an error is made, make corrections by drawing a single line through the error and initialing it.

- Maintain control of the logbook and keep in a secure location.

Field logbooks will contain, at a minimum, the following information, if applicable:

General Information

- Name, location of site, and work order number.

- Name of the Site Manager or Field Team Leader.

- Names and responsibilities of all field team members using the logbook (or involved with activities for which entries are being made).

- Weather conditions.

- Field observations.

- Names of any site visitors including entities that they represent.

Sample Collection Activities

- Date(s) and times of the sample collection or event.

- Number and types of collected samples.

- Sample location with an emphasis on any changes to documentation in governing documents (i.e., SAP, FSP). This may include measurements from reference points or sketches of sample locations with respect to local features.

- Sample identification numbers, including any applicable cross-references to split samples or samples collected by another entity.

- A description of sampling methodology, or reference to any governing document (i.e., FSP, SAP, QAPP).

- Summary of equipment preparation and decontamination procedures.

- Sample description including depth, color, texture, moisture content, and evidence of waste material or staining.

- Air monitoring (field screening) results.

- Types of laboratory analyses requested.

Site Health and Safety Activities

- All safety, accident, and/or incident reports.
- Real-time personnel air monitoring results, if applicable, or if not documented in the HASP.
- Heat/cold stress monitoring data, if applicable.
- Reasons for upgrades or downgrades in personal protective equipment.
- Health and safety inspections, checklists (drilling safety guide), meetings/briefings.
- Calibration records for field instruments.

Oversight Activities

- Progress and activities performed by contractors including operating times.
- Deviations of contractor activities with respect to project governing documents (i.e., specifications).
- Contractor sampling results and disposition of contingent soil materials/stockpiles.
- Excavation specifications and locations of contractor confirmation samples.

General site housekeeping and safety issues by site contractors.

SOP	**1502.01**				
GROUP	Field Documentation				
SUB-GROUP					
TITLE	Photograph Logs				
DATE	9/8/2005	**FILE**	1502-01.DOC	**PAGE**	1 of 1

INTRODUCTION

The following Standard Operating Procedure (SOP) presents the requirements for collecting information related to photodocumentation of site activities.

FORMS

Blank Photograph Logs can be printed from WESTON On-Line from the Records Management Application. Selecting the Reports/Project Planning/Blank Photo Logs menu option will generate a project specific log with 36 entries.

PROCEDURE

Photographs

Unless specifically requested by the EPA Assignor, START-2 will document all site, sampling and special events using photographs. Photographs will be used so they can be electronically scanned for use in trip reports and other site deliverables. Slides will be taken only if specifically requested by the EPA Assignor.

START will use digital cameras, as available, from the START-2 office. This will eliminate film and processing costs and save labor by eliminating the need for scanning each photograph independently. If digital cameras are not available, standard 35mm cameras will be utilized.

<u>Use of 35 mm Film</u>

- Uniquely number each roll of film obtained for use.
- Record the following information for each negative exposed:

    1. Date and Time.
    2. Photographer Name.
    3. Witness Name.
    4. Orientation (Landscape, Portrait, or Panoramic).
    5. Description (including activity being performed, specific equipment of interest, sample location(s), compass direction photographer is facing).

- Record “NA” for the negatives not used if the roll is not completely used prior to development.

- Record unique roll number on receipt when film is submitted for development.

- Verify descriptions on log with negative numbers when photographs are received from processing.

All cameras should utilize a date stamp feature to document the date of the photography. Descriptions of the photograph subject, date, time, site name and location should be noted in the site log book which can be translated to photograph labels following developing. It is not necessary to record film speed, camera type or lens size for automatic cameras using standard settings. Special lenses, lens filters or other photograph enhancement features should be noted in the log book.

Video Tape

When requested on a TDD, START members will document site activities using hand-held video recorders. High quality videotapes will be utilized to accommodate future copying, dubbing and splicing activities. All video cameras should utilize the date stamp and video counter features to help identify if the film has been edited or altered.

SPECIFIC PROTOCOL

Adhere to the following protocol for both photographic and video documentation:

- Enter description of filming activities in the site log book documenting type of camera, time (military time) and date, filming individual, and orientation angle of the viewing angle.

- Print the site name, PCS number, and coverage dates on each roll of film/diskette/video tape that has been used.

- Submit film as necessary for processing to ensure that all information on the developing envelope is complete.

- If film is not processed in a timely manner, notify the vendor immediately.

- Label all photographs/video with information including the project PCS#, site name, site location, date and time, description of photograph, and photographer.

- Store all site negatives, original videos or diskettes in the official site file.

- Be objective for all photographs/video. Ensure the purpose of the photograph is entered into the site log (e.g., documenting labels for enforcement, or condition of neighboring properties prior to the initiation of a removal action, or documenting an exposure pathway).

SOP	**1502.02**			
GROUP	Field Documentation			
SUB-GROUP				
TITLE	Photograph Management and Reporting			
DATE	4/30/02	**FILE**	1502-02.DOC	**PAGE** 1 OF 1

INTRODUCTION

The following Standard Operating Procedure (SOP) presents the requirements for managing and reporting information related to photodocumentation of site activities.

PROCEDURE

Enter the Photograph Log information specified in SOP 1502.01 into WESTON On-Line *Records Management Application*. The data entry screen can be accessed by selecting the *Data/Photograph Log* menu option.

REPORTS

Complete Photograph Logs can be printed from WESTON On-Line from the *Records Management Application.* Selecting the *Reports/Summary Tables/Photographs/Logs* menu option will generate a specific log for a selected roll of film.

Photograph Templates can be printed from WESTON On-Line from the *Records Management Application.* Selecting the *Reports/Summary Tables/Photographs/Templates* menu option will generate templates for mounting the photographs for a selected roll of film.